# Claims

[c1] 1.A system for quantifying baseline model quality, comprising:

an engine service database containing engine data;

a preprocessor for processing the engine data into a predetermined format;

an engine baseline modeling component that builds an engine baseline model from the preprocessed data, wherein the engine baseline model relates engine performance variables as a function of engine operating conditions; and

a model diagnostics component that evaluates the performance of the engine baseline model, wherein the model diagnostics component includes:

means for comparing engine data from a plurality of engines against the engine baseline model;

means for generating engine trends for each of the plurality of engines;

means for identifying correlations between the engine trends and various parameters; and

means for calculating, for each identified correlation, summary statistics relating to the degree of correlation.

[c2]   2. The system of claim 1, wherein the means for identifying correlations between engine trends and various parameters further generate correlation coefficients for each identified correlation.

[c3]   3. The system of claim 1, wherein the summary statistics include at least one of a standard deviation, a mean, or a histogram for each identified correlation.

[c4]   4. The system of claim 3, wherein a good model is best represented by summary statistics tending toward zero.

[c5]   5. A system for quantifying baseline model quality, comprising:

an engine service database containing engine data;

a preprocessor for processing the engine data into a predetermined format;

an engine baseline modeling component that builds an engine baseline model from the preprocessed data, wherein the engine baseline model relates engine performance variables as a function of engine operating conditions; and

a model diagnostics component that evaluates the performance of the engine baseline model, wherein the model diagnostics component includes:

means for evaluating, a subset of the engines used to create the model in time order against the generated

baseline;

means for generating time-varying system trends;

means for plotting data points representative of the time-varying system trends over time;means for fitting a smoothed curve to the plotted data points; and

means for computing residual errors for each point.

[c6]  6.The system of claim 5, wherein residual errors computed reflect the amount by which each trend point varies from the smoothed curve.

[c7]  7.The system of claim 5, wherein the model diagnostics component further comprises:

means for estimating a sigma value by performing a root mean squared error calculation; and

means for generating summary statistics using the estimated sigma values.

[c8]  8.The system of claim 7, wherein a good model is best represented by lower estimated sigma values.

[c9]  9.A method for quantifying baseline model quality, comprising:

storing engine data in an engine service database;

processing the engine data into a predetermined format;

building an engine baseline model from the preprocessed data, wherein the engine baseline model relates

engine performance variables as a function of engine operating conditions;

evaluating performance of the engine baseline model;

comparing engine data from a plurality of engines against the engine baseline model;

generating engine trends for each of the plurality of engines;

identifying correlations between the engine trends and various parameters; and

calculating, for each identified correlation, summary statistics relating to the degree of correlation.

[c10]     10.The method of claim 9, wherein identifying correlations between engine trends and various parameters further comprises generating correlation coefficients for each identified correlation.

[c11]     11.The method of claim 9, wherein the summary statistics include at least one of a standard deviation, a mean, or a histogram for each identified correlation.

[c12]     12.The method of claim 11, wherein a good model is best represented by summary statistics tending toward zero.

[c13]     13.A method for quantifying baseline model quality, comprising:

storing engine data in an engine service database;

processing the engine data into a predetermined format;

building an engine baseline model from the prepro-
cessed data, wherein the engine baseline model relates
engine performance variables as a function of engine
operating conditions;

evaluating performance of the engine baseline model;

evaluating a subset of the engines used to create the
model in time order against the generated baseline;

generating time-varying system trends;

plotting data points representative of the time-varying
system trends over time;fitting a smoothed curve to the
plotted data points; and

computing residual errors for each point.

[c14]    14.The method of claim 13, wherein residual errors
computed reflect the amount by which each trend point
varies from the smoothed curve.

[c15]    15.The method of claim 13, further comprising:
estimating a sigma value by performing a root mean
squared error calculation; and
generating summary statistics using the estimated sigma
values.

[c16]    16.The method of claim 15, wherein a good model is
best represented by lower estimated sigma values.

[c17]  17.A computer-readable medium incorporating instructions for quantifying baseline model quality, comprising:

one or more instructions for storing engine data in an engine service database;

one or more instructions for processing the engine data into a predetermined format;

one or more instructions for building an engine baseline model from the preprocessed data, wherein the engine baseline model relates engine performance variables as a function of engine operating conditions;

one or more instructions for evaluating performance of the engine baseline model;

one or more instructions for comparing engine data from a plurality of engines against the engine baseline model;

one or more instructions for generating engine trends for each of the plurality of engines;

one or more instructions for identifying correlations between the engine trends and various parameters; and

one or more instructions for calculating, for each identified correlation, summary statistics relating to the degree of correlation.

[c18]  18.The computer-readable medium of claim 17, wherein the one or more instructions for identifying correlations between engine trends and various parameters further comprise one or more instructions for generating corre-

lation coefficients for each identified correlation.

[c19]  19. The computer-readable medium of claim 17, wherein the summary statistics include at least one of a standard deviation, a mean, or a histogram for each identified correlation.

[c20]  20. The computer-readable medium of claim 19, wherein a good model is best represented by summary statistics tending toward zero.

[c21]  21. A computer-readable medium for quantifying baseline model quality, comprising:
one or more instructions for storing engine data in an engine service database;
one or more instructions for processing the engine data into a predetermined format;
one or more instructions for building an engine baseline model from the preprocessed data, wherein the engine baseline model relates engine performance variables as a function of engine operating conditions;
one or more instructions for evaluating performance of the engine baseline model;
one or more instructions for evaluating a subset of the engines used to create the model in time order against the generated baseline;
one or more instructions for generating time-varying

system trends;

one or more instructions for plotting data points representative of the time-varying system trends over time;one or more instructions for fitting a smoothed curve to the plotted data points; and

one or more instructions for computing residual errors for each point.

[c22]   22.The computer-readable medium of claim 21, wherein residual errors computed reflect the amount by which each trend point varies from the smoothed curve.

[c23]   23.The computer-readable medium of claim 21, further comprising:

one or more instructions for estimating a sigma value by performing a root mean squared error calculation; and

one or more instructions for generating summary statistics using the estimated sigma values.

[c24]   24.The computer-readable medium of claim 23, wherein a good model is best represented by lower estimated sigma values.